7
Mobile Payments: The Second Wave

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7.1 "M-payments": an elusive concept

When addressing the issue of m-payments, it is difficult to come up with a proper definition. The term remains as opaque as ever. As a consequence, "m-payments" refers to very different types of payments that only have in common that the mobile phone is used somewhere in the payment process. The mobile phone is used as:

- a plastic body,
- an identifier (using the SIM),
- a communication channel,
- a computer and
- a payment terminal.

Mobile phones are used for payments in the mobile Internet, they are used for proximity payments at the POS and they are used for P2P payments.

Thus, one and the same thing may sometimes be labelled as "m-payment" and sometimes as "e-payment". For instance, take someone who enters the Internet, initiates a purchase on the Amazon website and selects direct debit as payment option. If a laptop is used, the transaction is labelled "e-payment"; if a smart phone is used, it is labelled "m-payments". If someone uses a Near Field Communication (NFC) enabled credit card at the POS, he makes a "card payment"; if he uses an iPhone connected to the same underlying card account, it is an "m-payment". Or what about those chip cards that can be glued to the plastic body of a mobile phone? If such a device is used should the transaction be labelled as "m-payment" or "card payment"?

J. Górka (ed.), *Transforming Payment Systems in Europe*

So, often there is no clear dividing line between m-payments and other types of payment. At the same time, the types of payment that are principally regarded as "m-payments" differ substantially. An "m-payment" could be a credit transfer initiated from a mobile phone, a transfer of e-money, a payment via the mobile Internet, a payment at the POS – using NFC or the camera of the phone and a QR code. Arguably, it could also be a payment where the mobile phone is used as a payment terminal. This fuzziness of the term makes it difficult to come up with generalisations.

7.2 The first m-payment wave

Currently, we are witnessing the second mobile payment wave. The first wave roughly went in parallel with the dotcom boom. The dotcom crash in the year 2000 also marked the end for many m-payment initiatives. Subsequently, it took more than ten years for m-payments to recover. Today, m-payments are, once again, grabbing the headlines and attracting a lot of investment. Given the boom-and-bust history of m-payments, it is instructive to consider what lessons can be drawn from past failures.

The first m-payment boom was driven by three related developments:

- the ongoing spread of mobile telephony,
- the expected expansion of m-commerce and
- the dotcom boom.

Principally, m-payments can be used for m-commerce, e-commerce and in the real world. In the real world, it is the pure number of mobile phones that makes them a promising payment device. In 2002, the number of mobile users passed the one billion mark. Moreover, the market was confident (with reason) that ultimately almost universal coverage could be reached. Phone-based chip cards already outnumbered payment cards with chips. According to EuroSmart, an industry body, in 2000 the chip card industry shipped 370 million micro-processor cards to the telecoms industry and 120 million to the banking industry.[1] Given that in some areas of the world almost everybody would own a mobile phone equipped with a chip, some observers doubted that a separate card-based e-purse would still be required for making payments.

The spread of mobile phones also held big promise for the future of m-commerce. Indeed, the industry was highly optimistic. While mobile phones were mostly used for voice traffic, SMS (Short Message Service)

had caught on with surprising speed and operators were hoping that MMS (Multimedia Message Service) would become equally popular. The main bottleneck consisted of limited bandwidth of the mobile networks. However, as the huge amounts paid for 3G licenses showed, the mobile operators were prepared to invest heavily to change this. The UK auction in 2000 raised £22.5 billion (EUR 38.3 billion),[2] and the German auction even yielded EUR 50.8 billion. Such high bids were made possible by the dotcom boom that pushed up the value of mobile operators and made it easy for them to raise large sums of fresh capital. Not surprisingly, the dotcom crash also marked the end for many m-payment projects.[3] Capital became scarce and many projects were postponed or silently closed down. However, as the subsequent development showed, other factors, as well, were at work. These impediments were to make m-payments a niche product for almost ten years.

The mobile Internet was a big promise, but initially, mobile operators could not deliver. Data transmission was slow and hand-sets were too primitive. The first rollouts (remember WAP?) were a complete disaster, and even subsequent developments did not spark enthusiasm. Thus, at the POS, m-payments did not deliver, and on the mobile Internet there still was no market. In spite of all the hype, the technology was not yet ready to offer customers a breath-taking experience. With hindsight, we can say that mobile phones were not yet powerful enough to replace PCs and laptops as platforms for handling all kinds of interesting content. Moreover, bandwidth remained a problem.

Similarly, the use of mobile phones for POS payments was cumbersome and slow and could not convince potential users. Contactless was not (yet) an issue. Consider the example of Paybox: Founded in 1999, Paybox (50% owned by Deutsche Bank) launched a much hyped m-payment service in five European markets. It was usable at the POS on the Internet and for P2P payments. However, the number of users (consumers and merchants) remained limited. When looking the steps of a Paybox transaction at the POS, it becomes clear why:

1. Consumer provides merchant with his mobile phone number (or Paybox number).
2. Merchant transfers the number and the amount payable to Paybox.
3. Paybox calls you on your mobile phone and quotes the amount and the merchant.
4. Consumer authorises the payment with the Paybox PIN and confirms pressing hash.

Wonderful – isn't it? Somehow, users were not convinced, and when the dotcom boom burst, Deutsche Bank pulled the plug. Much has changed since 2000, and therefore, from a technological point of view the m-payment's future looks much brighter now than ten years ago.

The only model of the first m-payment wave that has survived and continues to thrive is operator billing. Paying for ring tones and other digital goods that can be downloaded directly on the mobile phone has been a huge success. The foremost customers are youngsters who often do not have a bank account or a credit card. So, operator billing is the only way they can make a payment. This billing service has been a huge success for mobile operators, and it is expected that billing volumes will continue to grow well into the future (Hernandez, 2014). This part of the m-payment business has somewhat remained in obscurity. Other ventures received much more attention. However, whatever else the mobile operators tried in m-payments was far less successful. Finally, the dotcom crash reduced the appetite for new pilots, and the whole m-payment topic ceased to draw public attention.

7.3 The second m-payment wave: technology

7.3.1 The rise of NFC

For quite some time contactless payments – using Near Field Communication (NFC) – have been a big issue. Contactless has not only sparked hopes that cards may finally win the "war on cash". NFC has also been one of the drivers of a second m-payment wave.[4] The reasons are straight-forward. First, payment applications can also be stored on a mobile phone and, second, an increasing number of mobile phones have been equipped with NFC. Thus, a phone can perform the same functions as a card. Moreover, a phone can provide additional functions, in particular, a mobile phone equipped with the necessary software (app) may allow a user to communicate with the card (to carry out balance enquires, view transactions data, etc.).

So far, implementation has been restricted by the lack of contactless acceptance points. With the spread of NFC terminals, this obstacle is losing significance. In the US, Apple Pay has been a big success, so far (see below), in spite of a limited availability of NFC terminals. However, one should not forget that NFC has been introduced to make card payments faster and more convenient, and it may still be the case that cards, rather than mobile phones, will be used primarily at NFC terminals (Judt and Viola, 2013).

For the moment, NFC is the most widely used technology for contactless payments. But it should not be forgotten that there are other technologies, such as Bluetooth and QR Code, that can be transmitted with the help of the mobile phone's camera or even additional devices using Magnetic Secure Transmission (MST) technology that allows mobile phones to communicate with the old generation of terminals (see www.looppay.com).

7.3.2 Host card emulation

The spread of NFC has given a big push to mPOS. But some impediments have remained. The standard mPOS model basically mimics the payment card. Instead of storing payment data on a chip card, they are stored on a secure element (SE) within the phone. That could be either the SIM card (model 1), an embedded SE of the phone (model 2) or a micro SD card (model 3). The first model requires banks to co-operate with mobile network operators (MNOs). This has been a conflict-prone issue in the early 2000s, and the same is true today. Moreover, since the customers of a bank are using different MNOs, a bank would have to deal with all MNOs in a particular country. The second model is currently used in co-operation with Apple. This model seems to work well but comes at a price for the banks. The third model is costly because banks would have to provide customers with the card – implying extra costs of the micro SD card and for its safe delivery.

Host Card Emulation (HCE) gets around these problems.[5] With the availability of phones with an NFC interface directly connected to the operating system (OS) of the phone, HCE can be used to side-step the necessity of an SE in the phone by "putting the SE in the cloud". This has been made possible by the 2014 version of Android (Android KitKat 4.4). Mobile phone holders may download a payment app that will store the payment credentials and manage the communication with contactless terminals. For payment terminals, the phone looks just like a contactless smart card.

Obviously, storing credentials in the SE is more secure than storing them in the unprotected memory of the phone. Permanent payment credentials would not be safe enough in the phone's memory. Thus, HCE requires an adjustment of the security architecture. Use of tokens would be a possibility. In order to be able to carry out a transaction even if the phone is offline, a new token would have to be stored on the phone ahead of the transaction.

Both card schemes, Visa and MasterCard have strongly endorsed tokenisation. Therefore, it does not come as a surprise that both card

schemes have also been quick to endorse HCE.[6] While HCE may be a way to cut out MNOs, it involves a new player that may also be difficult to deal with, the providers of mobile operating systems, in particular Google, the provider of Android. Android is mostly free and open source. Still, Google is a powerful player with vast resources and its own ambitions in the world of payments. HCE would make the card industry less dependent on MNOs but more dependent on the providers of mobile operating systems. Moreover, the position of wallet providers such as Google, Amazon and PayPal may be strengthened.

The success of HCE at the POS cannot be taken for granted because HCE may have its drawbacks in terms of user experience. Since permanent payment credentials cannot be safely stored on the phone, payments can only be carried out if a token has been stored in advance. Therefore, whenever connectivity is a problem, payment may temporarily be impossible. Moreover, even if Android currently is the clear market leader, full market coverage would require that other mobile OS providers would also be on board. Thus, HCE would have to be working well with different operating systems, each potentially out in the market with various releases. Making sure that the result will be robust and convenient for users may be quite a challenge.

In Europe, the emergence of hub TSMs (Trusted Service Managers) may make it easier for MNOs and banks to co-operate. In Poland, MasterCard-owned Trevica (http://www.trevica.pl/) allows banks to upload payment applications to the phones of various MNOs. This model is currently exported to other European countries (see MasterCard, 2014b). Thus, the SIM-based approach is also advancing.

Contactless will succeed if it is fast and convenient. Maybe HCE-based mobile payments will be able to deliver. But given the complexities of the processes involved, one wonders whether this model is suited for payments made by "tap" or "wave". In the end, the winning model of contactless m-payments may be the reduced size plastic card glued to the back of the phone.[7]

7.3.3 The spread of smart phones and the rise of the mobile Internet

The payment requirements of e-commerce have been met to an astonishing degree by existing payment systems. In some cases, existing systems were used without any change (paper check, cash on demand, credit transfer). In other cases, there were smaller modifications (credit card or debit payment without signature). Finally, there are cases of more complex adaptations to the Internet (Verified by Visa, SecureCode

and the integrated online credit transfer). The strong performance of existing payment systems has made it difficult for innovative newcomers to enter the market.

The same may happen in the world of m-commerce. After all, the payment environment is not so radically different from the e-payment environment. Nevertheless, there has been a big push to develop mobile wallets that are meant to store all kinds of payment credentials plus loyalty coupons, tickets, etc. In fact, there are so many offers that a "War of the Wallets" (Seyedi, 2015) has been diagnosed.

It is still too early to predict the outcome. However, it should not be forgotten that in e-payments, one particular provider gained a large slice of the market: PayPal. Looking at German m-payment figures, PayPal may be about to replicate this success in m-payments.

7.4 The second m-payment wave: some success stories

7.4.1 M-Pesa

It is not quite right to put M-Pesa into the second wave. In a way, M-Pesa and similar schemes appearing in Africa are a development in their own right. However, after the burst of the first m-payment wave, M-Pesa has been continuously used as a showcase and as a kind of benchmark for other markets. In particular, policy makers in industrialised countries, most notably Europe, used M-Pesa as a proof that there is gap in the payment system and that something needs to be done to promote m-payments.

So what is M-Pesa, a joint venture of Vodafone and African mobile operator Safaricom, all about? Two things are essential. First, M-Pesa has been rising in a country where most people do not have a bank account. Second, the success of M-Pesa is based not only on an m-payment technology but also on a network of agents that allow customers to convert cash into mobile money and vice versa.

In a way, M-Pesa has converted prepaid mobile accounts into rudimentary bank accounts. Most importantly, is has provided the unbanked with the ability to perform something like a credit transfer. M-Pesa was launched in 2007 in Kenya and subsequently expanded to Tanzania (2008), Fiji (2010), South Africa (2010), the Democratic Republic of the Congo (2012), India (2013), Mozambique (2013), Egypt (2013), Lesotho (2013) and Romania (2014).

Kenya is the showcase for M-Pesa. Safaricom, Vodafone's partner in Kenya, derives almost 20% of its revenue from M-Pesa. There are

nineteen million customers, of which thirteen million are active on a monthly basis. The service is made accessible by an agent network of 81,025. Moreover, there are 122,000 registered merchants, of which 20% were actively using M-Pesa in 2014 (Safaricom 2015, p. 10 and p. 42).

It cannot be disputed that M-Pesa is providing a hugely beneficial service for its users. It is frequently overlooked that M-Pesa only works because there is a large agent network that allows users to convert cash into M-Pesa funds (e-money) and vice versa. Thus, the notion that systems like M-Pesa allow countries like Kenya to jump straight into the a cashless m-payment world is only 50% correct. The key benefit of M-Pesa has been to allow users to send and receive cash in a convenient way. As Figure 7.1 shows, there is a large net transfer from the city to district and rural areas.

To make this possible, there must be a corresponding flow of cash on the wholesale side of the business. Either large agents themselves have to transport cash to rural areas, or the banks who serve agents have to do this.

Meanwhile, M-Pesa does not only offer mP2P and mPOS but it is also venturing into other payment services, usually provided by banks: "salary disbursements, utility payments, airtime purchase and cashless distribution for companies such as Coca Cola, Unilever, East African Breweries Ltd, British American Tobacco, Nation Media, Standard Group etc." (Safaricom 2014, p. 42).

In markets with a developed banking system, fund transfers and the service of providing cash and accepting cash deposits are provided by the banking system. Off and on, banks are doing a pretty good job, and

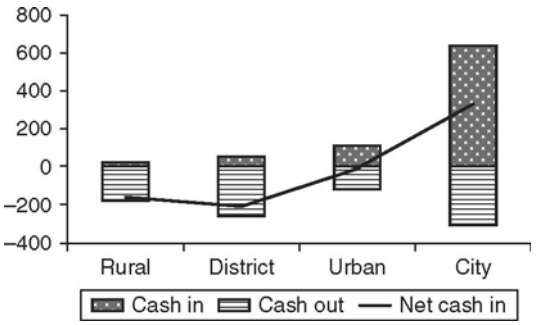

Figure 7.1 Average daily values of client transactions in Kenyan Shilling '000
Source: Based on Eijkman *et al*. (2010), p. 236.

there seems to be little scope for new contenders. Therefore, the notion that countries like Kenya are "ahead" and other regions like the European Union have to "catch up" is also completely misplaced. Rather, M-Pesa shows how the mobile phone, the prepaid accounts of the phone users and the agent networks that were initially built to sell prepaid airtime can be used to create a rudimentary banking system, providing huge benefits to the formerly unbanked.

7.4.2 Apple

Combining the mobile phone and NFC has been a topic for a number of years, already. (Remember the Visa pilot during the London Olympics?) But the topic really took off only with Apple's launch of "Apple Pay" in the US in October 2014 (Apple, 2014). Apple Pay allows its users to make contactless payments at the POS. It works on the iPhone 6 and the Apple Watch. Moreover, it is compatible with the iPhone 5, iPhone 5c and iPhone 5s.

Apple Pay relies on an NFC antenna and a secure embedded chip (secure element). Its Passbook software allows users to store multiple payment cards on the secure element alongside loyalty cards, boarding passes, coupons, etc. When using an iPhone the user can rely on Apple's Touch ID for authentication. However, when using the Apple Watch, this security feature is not available; users simply have to double-click.

Like other initiatives, Apple Pay tries to replace the plastic card at the physical POS. But Apple will not be involved in the payment flow and will not track customer transactions. Thus, for the moment it acts more like a technical service provider. It is noteworthy, however, that Apple does not simply put a toe into the water. Rather it takes a determined step, partnering with the main card schemes, American Express, MasterCard and Visa, and most of the large bank card issuers in the US (including Bank of America, Capital One Bank, Chase, Citi and Wells Fargo).

Apple's move has been heralded as "New Era at Cash Register" (Isaac, 2014). But what exactly is going to change? If Apple (and other contenders) were successful, cards would be replaced to some extent by smartphones. But that does not mean that the traditional players of the large four-party card schemes will also be replaced. For the moment, Apple relies on these players to deliver its payment service. Apple itself provides a wallet that contains card credentials that can be used for payments. Unlike PayPal, Apple is not integrated into the payment flow. Apple does not provide e-money or payment accounts. In this sense, the Apple wallet is more like a "container" whereas the PayPal wallet

includes PayPal branded payment services. This matters from a business point of view. Apple does not pose a threat to financial institutions, yet.

There is a hitch, however. If press reports are to be believed, Apple receives a hefty fee of 0.15% for providing "container services" (or "wallet services") (Fiveash, 2014). The mere fact that Apple has been able to negotiate such a high fee already shows its strong position vis-á-vis the banks. If Apple Pay were to become a success and a significant share of consumers were to use it, Apple's service as a kind of gatekeeper would be even more valuable. The banks would be more and more dependent on Apple. So far, banks have always tried to avoid such a position of dependency. In the past, this has been a major stepping-stone in joint projects between mobile operators and banks. Banks were hesitant to put payment applications on operator-controlled SIM cards. In particular, they did not like the idea of having to pay operators for using the SIM. Now, in the end, this is the model they have agreed upon with Apple. Maybe in the future there will be a similar deal with Google.[8] But will the banks be happier and less dependent with these two giants as partners than they would be with the operators?

It is still too early to predict how well Apple Pay will be doing. Current performance seems to be promising. Market research found that Apple Pay has surpassed PayPal as a mobile payment instrument in the US (see 451 Research, 2015). However, a lot will depend on the success of EMV (the Europay, MasterCard and Visa technical standard) implementation in the US. With the installation of new chip-enabled card terminals the NFC-capability is likely to spread significantly.[9]

According to Paypers (2015), in early spring 2015 Apple Pay was accepted at 700,000 merchant locations equipped with NFC terminals. Even if these acceptance figures sound impressive, success is not a foregone conclusion. Given that the large card payment processor and acquirer First Data alone serves 3.9 million merchant locations in the US, 700,000 locations is not much more than a drop in the bucket. Thus, a significant replacement of cards by mobile phones seems a long way off. Worse, in spite of the customary user friendliness of Apple products, customers may be disgruntled by the lack of acceptance points and finally quit using m-payments.

Apple Pay is expected to be rolled out in other countries, as well. Looking at Europe, things may be more difficult for Apple. Even though parts of Europe are ahead of the US in terms of EMV implementation, regulation may prove to be an obstacle. First, the EU has just passed a regulation of interchange fees that sets a maximum of 0.3% for credit

card transactions. Given such a low value, it seems highly unlikely that European banks would be prepared to offer the same 0.15% that the US banks reportedly are paying.[10] So, the question is whether Apple would be prepared to settle for substantially less. If not, it would have to convince merchants (the beneficiaries of low interchange fees) to contribute.

The EU also regulates payment service providers more tightly. The new PSD2 has introduced "payment initiation" as a service that will be regulated in the future.[11] When drawing up the PSD2 draft version, regulators had services in mind that allow payers to initiate a credit transfer and immediately send a confirmation to the merchant – so-called "online banking based e-payment" solutions (OBeP). However, Apple provides a very similar service with Apple Pay. Apple helps card holders to access their card account and initiate a payment transaction. The issuer of the card even relies on Apple to authenticate the owner of the card account. The need to get a payment institution license may be a show-stopper for Apple.

Apart from regulation, another important factor that may make it more difficult for Apple to extract fees from other market players is the lower market share of Apple phones in Europe, where Android is the clear market leader.

Apple basically offers part of its base of dedicated Apple users as potential m-payment customers (the shaded area in Figure 7.2). What do the banks have to gain? They are providing an extra service to their customers that will make it easier for them to retain existing customers and gain new ones. Partnering with Apple allows them to limit the required investment and to profit from Apple's strong brand. As noted above, this comes at a price. Issuing banks pay a transaction fee to Apple, and they are becoming dependent on Apple.

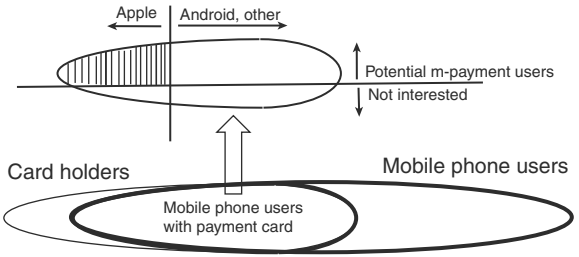

Figure 7.2 What Apple has to offer to card issuers

Meanwhile Google shows that it is unwilling to leave the m-payment field to Apple. Google has bought "Softcard", the payment joint venture of US mobile operators, and has announced that it will offer an Android-based solution, "Android Pay," similar to Apple Pay (Paypers, 2015).

Overall, one may wonder what has prompted Apple to enter the payment arena. In a way, the move into payment is reminiscent of Apple's bold move into selling music over iTunes. When Apple started its iTunes service, it also had only a limited customer base to sell to. Still, it was able to extract favourable conditions from the music industry. At a reasonable price, Apple was able to offer legal music downloads at unparalleled ease of use. The rest is history. Apple ventured into selling apps and became the most expensive brand in the world. Will the same magic work in the field of payments? Probably not. The reason is simple. The payment industry has done a better job in its own field of expertise than the music industry. In spite of frequent allegations to the contrary, there are no huge gaps in the payments field. Payment cards (and cash) are working well at the POS, and they are getting more convenient. Actually, Apple is piggybacking on the industry's current move towards contactless.

But whatever the future brings for Apple Pay, its start has been promising and it shows how one determined player may shake things up.

7.4.3 Square

Like fifteen years ago, the mobile phone is predominantly seen as a consumer device and correspondingly as a potential replacement of the payment card. Less noticed are developments on the acquiring side of the market. The mobile phone is increasingly used as a low-cost payment terminal for POS payments. The best-known example is Square, a US company. But the idea to use smart phones as payment terminals has also been adopted by other players: established acquirers or new upstarts. In some cases, the use of a smart phone as payment terminal does not even require additional hardware. Apart from the mobile phone and an acceptance contract, merchants only need to download a payment application. But often, as also in the case of Square, the phone is converted into a simple form of POS terminal via a card reader that is connected to the phone. In the US, the business model based on the mobile phone (with an attached card reader) used as a mobile card terminal ("m-terminal") has become an impressive success (see also PaySys Consultancy, 2011). Square, the American PSP that has pioneered this model, is serving three million customers (individuals and businesses) (see www.squareup.com). In August 2012, Square could even win Starbucks with its 7,000 stores in

the United States. Currently, the company is processing $10 billion in transactions. A recent financing operation valued Square at almost $3.3 billion (Guynn, 2013).

Like PayPal, Square is another example of the successful use of the sub-acquiring model. Square allows merchants to accept credit cards without entering into an explicit contract with an acquirer. Only under certain conditions do merchants have to enter into a contractual relationship with the acquirer with whom Square works (Paymentech).

In Europe, the Square business model has been copied by a number of companies such as Adyen, iZettel, SumUp, Payleven and Streetpay. These companies are expanding fast and are active on an international basis. Apart from these newcomers, established PSPs are also offering apps that allow merchants to accept card payments via smartphones (to name just a few examples, in Germany: B+S, ConCardis and TeleCash; in Spain: Euro6000).

It is yet too early to draw any conclusions. But current developments show that there may be a strong business case for m-payments in a segment that went mostly unnoticed: the merchant side of the market. If merchants do not have to buy expensive terminals, and if they can carry out software updates by themselves, card acceptance becomes much cheaper. Consequently, the range of potential card acceptors becomes much larger than it used to be. This is good news for merchants, cardholders, schemes and issuers. For PSPs on the acquiring side, the implications may be less favourable. Renting and servicing terminals may become a shrinking business segment. But, there are still some important issues to be addressed.

First and foremost, there is the security issue. Payment terminals are sophisticated pieces of hardware and software that do not come cheap. But there is a good reason for that: security. We have all learned that a flexible and intelligent device like the PC that is capable of running new programs is very convenient. But we also learned that convenience comes at a cost. Intelligent machines can get infected and do things we do not want them to do. The smarter mobile phones get and the more they are used for payments the bigger the danger becomes that they also will be infected by malign viruses. Given this threat, it remains to be seen whether the smartphone will become a payment terminal used beyond the segment of small traders with a low payment volumes.

It is still open whether the Square business model can be implemented one-to-one in Europe. Europe is an EMV area. So, card-present transactions should be chip and PIN. Moreover, EMV will not provide any

benefits in terms of safety if sensitive payment data can be typed in on any smartphone. Thus, it is not surprising that Visa insists that card readers come with a secure keyboard for typing in the PIN.

Chip card readers with a secure PIN pad – that does not sound like a cheap solution. But Square, iZettle and others seem to have found ways to provide cheap terminals that are chip-capable. Thus, the model may thrive even in an EMV world.

Meanwhile, Square has been moving into another field that is a traditional banking turf: credit (Square, 2015). Access to payment data seems to give Square the ability to offer its customers credit at competitive rates. If this should prove to be successful, banks should start to feel threatened.

7.5 Mobile P2P (mP2P)

M-Pesa has shown that mP2P may be a big success. However, M-Pesa evolved in an environment in which access to banking services is limited. It remains to be seen whether mP2P can be equally successful in the developed world.

For the moment, there seems to be strong push into this area. New companies are expanding fast and have built a dedicated client base. The US upstart Venmo, in particular, is in a strong position. It has been taken over by PayPal, a company with a proven track record in the world of e-payments. In the past, PayPal has successfully implemented a wallet for e-payments, turning the email address into a kind of bank account number. PayPal does not only have a large customer base of consumers but also a large merchant base. PayPal has proven itself capable of adjusting its systems to the requirements of mobile commerce. With the rise of the smartphone and the increasing implementation of NFC, it seems likely that PayPal will also be able to make the shift to the "real" POS, converting the mobile phone number into a kind of bank account number.

mP2P is also likely to profit from the installation of real-time bank transfers. Such systems, like FasterPay in the UK or Express Elixir and BlueCash in Poland (Górka, 2015), allows bank account owners to send funds in "real time" to other accounts.[12] If widely implemented, such systems would allow providers to cease using expensive funding methods such as credit cards. On the one hand, real-time credit transfers can be seen as direct competition to mP2P offered by PSPs like Venmo. If a real-time bank transfer can be initiated via a mobile banking app, why use an intermediary such as Venmo? However, given ease of use

and additional services such as buyer protection for PayPal users, mP2P providers may actually benefit from real-time credit transfers.

However, there are also problems that have to be overcome. First, security is an issue. Lately there have been complaints about systems like Venmo because of weaknesses in its security. Such problems have to be taken seriously, but ultimately it should be possible to fix them. However, in the long run, another issue may prove to be more serious: the unproven business case. Unless funded via credit card, Venmo payments are free, at the moment. The crucial question is whether users could be made to pay in the future. For now, market observers are doubtful. Thus, such mP2P systems need to find other revenue sources such as advertising, or they need to switch to a more traditional model that distinguishes merchants and consumers and provides merchant services against a fee.

7.6 Mobile operators on the side-lines?

Mobile operators have been experimenting for almost twenty years with m-payments. They have rolled out pilots, have formed (and disbanded) alliances, have partnered with banks and have lobbied regulators. All in all, a huge amount of money and management attention has gone into this area. But the results have been limited. To be sure, there have been some successes. Billing for ring tones, etc., has been a huge success. In countries with malfunctioning banking systems, mobile operators have been able to implement successful m-payments schemes like M-Pesa that provide some basic banking services to the unbanked.[13]

But apart from that, there seems to be little to show for the effort. In the US, AT&T, T-Mobile, and Verizon formed a joint venture ("Softcard", formerly known as "ISIS" and then rebranded for obvious reasons) to implement a joint method of m-payments. However, in 2015, Softcard was sold to Google and the payment application was integrated into Google wallet. Exit the mobile operators.

In Germany, to take another example, mpass was launched in 2008 as a joint venture of O2 and Vodafone with Telekom later joining. However, success has been limited and, at the moment, only O2 and Wirecard Bank, the issuer of the accompanying credit card, are actively promoting the system. Undeterred, German operators have started a new project "NFC City Berlin".

In the UK, Everything Everywhere, Vodafone and O2 formed a joint venture to launch a mobile wallet. However, after complaints from

competitors, the EU Commission launched an in-depth investigation which delayed the project.

In the end, one wonders why mobile operators want to be in payments. Payment is a service that requires users' trust. In this respect, telephone companies have consistently ranked at the end of the field in surveys carried out in Germany, Austria and Switzerland (see Table 7.1)

It would also help if the customer base were relatively stable. But mobile phone customers are notoriously fickle and frequently changing the provider. (Maybe churn is such a big problem that telcos hope to use payments to reduce churn?)

Payment requires risk management. While telcos also have to have some risk management in place, this is unlikely to be of the quality required for payments. Payments is increasingly becoming a compliance business. Do telcos want to get deeply involved in that? Finally, payments are not core business. The payment business is complicated, demands a lot of attention and may easily get you bad press. So, all in all, it is not clear why telcos keep on trying.

Maybe it would be best for mobile operators to concentrate on the niche (not a small one!) of digital goods charged to the customer account. This type of operator billing has functioned well and is predicted to do well in the future.

7.7 European policy

As the examples discussed above show, individual players can be highly successful when bringing m-payment schemes to the market. Using standardised infrastructure, they tailor their products to the needs of their clients and carry out changes and improvements of their products

Table 7.1 Survey results: which payment service providers do you trust on the Internet?

	Germany	**Austria**	**Switzerland**
Banks	61.3%	69.4%	56.5%
Established PSPs	56.7%	47.3%	49.8%
Payment card companies	36.8%	58.6%	63.5%
Providers of shopping platforms	43.3%	46.2%	39.6%
Telecommunication companies	20.8%	20.1%	17.7%
ISPs	10.0%	5.3%	16.0%
No preference	10.1%	6.3%	10.8%

Source: Klees *et al*. (2013, p. 60).

as they go along. Such an approach may take a long time to cover the entire market. But by moving fast and not having to co-ordinate with other market players the launch of the product can be carried out fairly quickly. This approach is exemplified by players such as M-Pesa, Square and Apple.

The approach favoured by European policy makers looks different. They want ex ante co-ordination to make sure that new products reach the entire European market. Important elements of the EU political approach can be found in a resolution of the European Parliament (EP) (European Parliament, 2012) which is based on the EU Commission's Green Paper on "an integrated European market for card, Internet and mobile payments" (European Commission, 2011). The EP wants mandated EU-wide acceptance:

> The European Parliament … is therefore of the opinion that all national card, mobile and internet payment schemes should join or turn themselves into a pan-European SEPA-compliant scheme, so that all card, mobile and internet payments would be accepted everywhere in the SEPA, and that a necessary period should be suggested by the Commission for this transition. (European Parliament, 2012, R6)

Moreover, it stresses the importance of standards and of a co-ordinated implementation effort (European Parliament, 2012, R18).[14] As far as the development of standards goes, the EP wants, of course, that a good governance model is used and that all stakeholders have a say. Therefore, the EP asks the EU Commission "to propose a better SEPA governance, … and allowing the development of technical and security standards to be organised separately in support of the implementation of the related legislation; calls for a more balanced representation of all stakeholders in the further development of common technical and security standards for payment schemes" (European Parliament, 2012, R28).

Obviously, in the area of payments, security is important, and accordingly the EP also has something to say about security standards. In particular, it wants a "common governing body setting the requirements" (European Parliament, 2012, R54).

In order to comply with the demands of the EP (which are largely based on the Commission's own ideas), the EU Commission has devised "The 2015 Rolling Plan on ICT Standardisation" (European Commission, 2015). In this "Rolling Plan" the EU Commission calls for more standardisation and interoperability:

> The advent of an integrated system of mobile payments in the EU is hampered by the lack of cross-border standardised and inter-operable technical solutions. The absence of shared standards, standardisation gaps and the lack of interoperability between the various market players are delaying the mass market adoption of this innovative payment method. (European Commission, 2015, p. 56).

But so far, the EU Commission does not envision any concrete steps:

> The European Commission doesn't plan yet to engage into specific legislation since it requires a more mature market. However, it will continue the co-operation and discussion with the institutional players and the ESOs, and will launch/support appropriate standardisation initiatives as soon as gaps and needs are identified. DG GROW will pursue its work on the mapping of the market for mobile payments. (European Commission, 2015, p. 56).

While favouring a co-ordinated approach, European policy makers have been suspicious of co-operation. Antitrust concerns have frequently led to investigations that cost market participants valuable time.

Already during the first m-payment wave, regulators were anxious to prevent any strong position in the emerging m-payment market. For instance, when the Spanish bank BBVA teamed up with Telefonica Moviles in 2000 to come up with a joint m-payment scheme (Movilpago), they were instantly scrutinised by the Spanish competition watchdog (see Krueger, 2001). Anti-trust authorities demanded that other banks and telcos were allowed to participate. Obviously, this slowed down the whole project, and then the m-payment wave burst and everything surrounding m-payments became much more difficult.

The same has happened in the recent past when "Project Oscar," a planned joint venture of Everything Everywhere, Orange and Vodafone, became subject to an "in-depth investigation" of the European Commission (European Commission, 2012a and 2012b). In the end, the joint venture was cleared, but the participants lost valuable time and have been pursuing other co-operations since (Meyer, 2012).

Anti-trust is not the only concern. Policy makers are also prescribing ever-more detailed security measures that PSPs have to implement. In the field of e-payments, the European Banking Authority (EBA) has published binding security guidelines (EBA, 2014). These measures are likely to find a legislative underpinning in the to-be-agreed Payment Services Directive 2 (PSD2). The European Central Bank (ECB) has

proposed almost identical guidelines for m-payments (ECB, 2014). If enacted, these security guidelines could prove to be a heavy burden for new m-payment ventures.

7.8 Summing up

The future role in payments of the mobile phone is still uncertain. For sure, Internet access will be increasingly carried out via mobile devices. But it is not yet clear whether that requires completely new payment instruments. Equally, the mobile phone may play a more important role at the POS. Still, it is by no means certain that it will replace cards to a large extend.

As far as policy goes, it is certainly true that standards are important. However, the approach favoured by the European Commission to look for a co-operative solution ex ante ("with all stakeholders") is a blueprint for standstill. Current innovations are building on standards such as common payment protocols or NFC. Nevertheless, in the product space, covering the relationship between service providers and consumers or merchants, proprietary solutions seem to be much more successful. This is a market-based "trial-and-error approach" rather than an attempt to fix everything between dozens of parties at the drawing board. Unfortunately, the current European regulatory paradigm seems to be completely different.

Notes

1. See Eurosmart market figures 2004–1999 (http://www.eurosmart.com/images/doc/WorkingGroups/Mkt-technoWG/eurosmart-figures-archives.pdf)
2. See National Audit Office (2001).
3. Krueger (2001, p. 8) provides a (non-exhaustive) list of m-payments schemes existing in the year 2001. Almost all of these have disappeared.
4. The first wave had its boom and bust roughly in parallel with the dotcom boom and bust. See Krueger (2001).
5. More information on HCE can be found on the Android website (https://developer.android.com/guide/topics/connectivity/nfc/hce.html) and in Consult Hyperion (2014).
6. See press releases from Visa (2014) and MasterCard (2014a).
7. But to be honest, while writing these lines the (Germany-based) author of this article is still waiting for an opportunity to carry out a contactless card payment.
8. Google's operating system Android is a more open system than iOS. From the banks' points of view this is an advantage.
9. There is no necessary link between EMV and NFC, but is likely that the installation of new chip-enabled terminals will lead to a huge increase in NFC capabilities.

10. Terms of commercial agreements for Apple Pay also seem to be an issue in Apple's negotiations with Canadian banks. See Trichur and Wakabayashi (2015).
11. "Payment initiation service" means a service to initiate a payment order at the request of the payment service user with respect to a payment account held at another payment service provider; Art 4 (32) (version of 1 December 2014). See also PaySys Consultancy (2015).
12. Salmony (2015) discusses the potential of a pan-European P2P m-payment system.
13. It still remains somewhat of a mystery why policy makers in developed countries think that the developed world urgently needs an M-Pesa-type m-payment system.
14. However, at the same time, the EP also does not want the EU Commission to mandate standards: "given the fast growing but, at present, immature phase of market development for electronic and mobile payments, imposing mandatory standards in these key areas for the enhancement of the digital single market in Europe would entail the risk of negative effects for innovation, competition and market growth" (R21).

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